INTERNATIONAL STANDARD

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Footwear — Critical substances potentially present in footwear and footwear components — Test method to quantitatively determine polycyclic aromatic hydrocarbons (PAHs) in footwear materials

Chaussures — Substances critiques potentiellement présentes dans les chaussures et les composants de chaussures — Méthode d'essai pour déterminer quantitativement les hydrocarbures aromatiques polycycliques (HAP) dans les matériaux de chaussures

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 216, *Footwear*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition cancels and replaces the first edition Technical Specification (ISO/TS 16190:2013), which has been technically revised. The main changes compared with the previous edition are as follows:

— the Introduction has been added;

— in the Scope, editorial changes have been made and a note has been added;

— the Normative references have been updated;

— Clause 3 “Terms and definitions” has been added and the following clauses have been renumbered;

— Clause 5 “Reagents” has been renamed and major technical changes have been made;

— Clause 6 “Apparatus” has been renamed, further equipment has been added and further minor technical changes have been made;

— Clause 7 “Sample preparation” has been added, which has been mainly taken from ISO/TS 16190:2013, 6.2, and the following clauses have been renumbered;

— in Clause 8 “Procedure”, major technical changes and editorial changes have been made;

— Clause 9 “Expression of results” has been renamed and subclause headings have been added;

— 9.1.2 “When a sum of PAH is requested” has been added;

— in 9.2 “Performance of the test method”, the limit of quantification has been changed;

— in Clause 10 g), the option to state a sum of PAH has been added;

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— Annex A has been added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Certain polycyclic aromatic hydrocarbons (PAHs) have been identified as carcinogenic. Thus, several countries have restricted them in articles such as footwear, e.g. in the European Union by Commission Regulation (EU) 2018/1513[1] amending Regulation (EC) No 1907/2006[2].

Restricted PAHs according to Regulation (EC) No 1907/2006 are Benzo[a]pyrene (BaP), Benzo[e]pyrene (BeP), Benzo[a]anthracene (BaA), Chrysene (CHR), Benzo[b]fluoranthene (BbFA), Benzo[j]fluoranthene (BjFA), (g) Benzo[k]fluoranthene (BkFA) and Dibenzo[a,h]anthracene (DBAhA).

Further PAHs are restricted by footwear brands in their restricted substances lists (RSLs).

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Footwear — Critical substances potentially present in footwear and footwear components — Test method to quantitatively determine polycyclic aromatic hydrocarbons (PAHs) in footwear materials

WARNING — The use of this document involves hazardous materials. It does not purport to address all of the safety or environmental problems associated with its use. It is the responsibility of users of this document to take appropriate measures to ensure the safety and health of personnel and the environment prior to the application of this document, and to fulfil the relevant requirements for this purpose.

1 Scope

This document specifies a method to determine the amounts of polycyclic aromatic hydrocarbons (PAHs) in footwear and footwear components.

NOTE A list of relevant materials can be found in ISO/TR 16178:2021, Table 1[3].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4787, *Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

The test sample is extracted using toluene at 60 °C in an ultrasonic bath for 1 h. An aliquot is then analysed using a gas chromatograph with mass selective detector.

5 Reagents

WARNING — Toluene is flammable. In addition, PAHs can cause cancer. Therefore, they should be treated taking into account relevant regulations on occupational health and safety.

Unless otherwise specified, analytical grade chemicals shall be used.

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